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OIPE IAP46 APR 17 2006 PATENT & TRADEMARK OFFICE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Michael C. SANDERS et al.	§	Confirmation No.:	6110
Serial No.:	10/017,785	§	Group Art Unit:	2836
Filed:	12/13/2001	§	Examiner:	R. L. Deberadinis
For:	Redundant Data And Power Infrastructure For Modular Server Components In A Rack	§	Docket No.:	200304298-1

DECLARATION OF PRIOR CONCEPTION IN THE UNITED STATES TO OVERCOME CITED PATENT OR PUBLICATION (37 CFR 1.131)

Mail Stop Amendment
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

PURPOSE OF THIS DECLARATION

This declaration is to establish conception of the claimed inventions prior to September 19, 2001, the filing date of the patent application entitled, "System and Method for Strategic Power Supply Sequencing in a Computer System," by O'Conner et al. (U.S. Application Pub. No. US2003/0056125 A1).

STATEMENT OF FACTS

1. The person making this declaration is an inventor of the subject matter claimed in the instant application.

2. One or more embodiments of the invention claimed in the instant application were conceived in the United States by the undersigned inventors at least just before September 19, 2001.

3. As the file history already reflects, Inventors Nguyen and Pascarella were unintentionally omitted as inventors on the instant application when filed. When the unintentional omission was discovered by Applicants' in-house counsel after the instant application had been filed, they were added in accordance with the appropriate procedures under the MPEP. Specifically, some aspects as claimed were originally disclosed by Inventor Sanders to outside counsel in a meeting, separately from some aspects disclosed in writing by Inventors Nguyen and Pascarella. The inventive concepts were subsequently combined in a single patent application, and erroneously only attributed to Inventor Sanders, though the inventors had worked together to jointly invent the claimed subject matter. Based on the invention disclosure form, Applicants' in-house counsel realized in approximately the beginning of February 2002 that both Nguyen and Pascarella had contributed to aspects of the claimed invention, and therefore, adding them as true inventors was necessary.

4. Exhibit Nguyen 1 attached hereto is submitted as evidence to establish a conception date prior to September 19, 2001. Exhibit Nguyen 1 includes an invention disclosure form, dated prior to September 19, 2001, and provided to outside counsel by Applicants' in-house counsel. The invention disclosure form was prepared by Randall Pascarella, and jointly reviewed and signed by the undersigned inventors prior to September 19, 2001.

The invention disclosure form provides support for claims 1 – 25 of the instant application. At least numbered paragraph 10 of the invention disclosure form provides support for claims 1 – 25 of the instant application. Other portions of the invention disclosure form may provide additional support for some or all of the claims of the instant application.

The fact that the contents of Exhibit Nguyen 1 were prepared by the Inventors prior to September 19, 2001 establishes conception of the subject matter of claims 1 – 25 in the instant application at least before September 19, 2001.

5. Exhibit Nguyen 2 attached hereto is submitted as evidence to establish a conception date prior to September 19, 2001. Exhibit Nguyen 1 includes disclosure PowerPoint™ slides provided to outside counsel to aide in preparation of the instant patent application prior to September 19, 2001. The disclosure PowerPoint™ slides were prepared by Michael Sanders, John Nguyen, and Randall Pascarella, and approved of by the undersigned inventors prior to September 19, 2001.

The disclosure PowerPoint™ slides provide support for claims 1 – 25 of the instant application. In particular, at least slides numbered 11, 12, 27, 32, and 33, of the disclosure PowerPoint™ slides provide support for claims 1 – 25 of the instant application. Other portions of the disclosure PowerPoint™ slides may provide additional support for some or all of the claims of the instant application.

The fact that the contents of Exhibit Nguyen 2 were prepared by the Inventors prior to September 19, 2001 establishes conception of the subject matter of claims 1 – 25 in the instant application at least before September 19, 2001.

6. At least some dates in Exhibits Nguyen 1 and Nguyen 2 have been redacted in accordance with MPEP 715.07. Redacted dates in the Exhibits Nguyen 1 and Nguyen 2 are prior to September 19, 2001.

7. I hereby declare that all statements made herein are true; that these statements are made from my own knowledge or otherwise on information believed to be true; that these statements are made with knowledge that willful false statements and the like are punishable by fine, imprisonment, or both, under Section 1001 of Title 18 of the United States Code; and that willful false statements may jeopardize the validity of the application or any patent issued thereon.

Respectfully submitted,

John D. Nguyen, INVENTOR

DATE: 4/11/2006

Randall Pascarella, INVENTOR

DATE: _____

APR-11-2006 TUE 11:23 AM HEWLETT PACKARD FAX NO. 281 518 7588 P. 05

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Serial No.: 10/017,785
Filing Date: 12/13/2001

7. I hereby declare that all statements made herein are true; that these statements are made from my own knowledge or otherwise on information believed to be true; that these statements are made with knowledge that willful false statements and the like are punishable by fine, imprisonment, or both, under Section 1001 of Title 18 of the United States Code; and that willful false statements may jeopardize the validity of the application or any patent issued thereon.

Respectfully submitted,

John D. Nguyen, INVENTOR

DATE: _____

Randall Pascarella, INVENTOR

DATE: 4-11-06

No. 98-2403 (for legal dept. use only)

COMPAQ

INVENTION DISCLOSURE FORM

-- COMPAQ CONFIDENTIAL --

PREPARED AND SUBMITTED AT THE REQUEST AND DIRECTION OF AN ATTORNEY

1. **DESCRIPTIVE TITLE: Central Rack Control Unit** EC64SPD

2. **INVENTOR(S): (If more than two inventors, use additional sheets)**

Name: John D. Nguyen Tel.: 281-514-0956 Mail code: 100508
Division: Corporate Servers
Name of Inventor's Supervisor: Glenn Brouwer

Name: Randall Pascarella Tel.: 281-514-2013 Mail code: 100508
Division: Corporate Servers
Name of Inventor's Supervisor: Glenn Brouwer

3. **CONCEPTION OF INVENTION:**

A. When did you first think of this invention?
B. Date of first written description.
C. Where is the description found? On my computer's hard disk (Randy Pascarella)

4. **PROTOTYPE CONSTRUCTION:**

A. When was this prototype first built and tested? Has not yet.
B. Was the prototype test successful?

5. **USE OR SALE OF INVENTION:**

A. Has this or will this be incorporated into a product? No plans.
B. When?
C. Name of product:

6. DISCLOSURE OF INVENTION TO OTHERS:

A. Was a disclosure of the invention made to any person NOT a Compaq employee?
Yes _____ No __X__

B. If a disclosure was made, when was it made?

C. To whom was the disclosure made?

D. Was the disclosure made under an obligation of confidence?
Yes _____ No _____

7. DESCRIPTION OF THE INVENTION

PLEASE ATTACH A WRITTEN DESCRIPTION OF THE FOLLOWING ALONG WITH ANY DRAWINGS.

A. General purpose of invention and subject matter area;
B. Particular problem faced by those working in the subject matter area;
C. Old method (s) of performing the function of invention;
D. Disadvantage of old method(s);
E. Construction and structure of preferred form of invention;
F. Advantages of the Invention.

John D. Nguyen
INVENTOR
Date:

Randy Pascarella
INVENTOR
Date:

6) Ability to set up a clustering fail-over pair(s) of servers for fault tolerance.
7) Ability to remotely run diagnostic utilities.
8) Ability to reduce cost for Small and Medium Business server products by using the SMAB as the production network medium.
9) Ability to support out-of-band communication (i.e. independent of the operating system - either in power standby mode, in POST, or a locked up system) between a rack server and the remote controlling host to diagnose problems or allow wake-on-command instructions,
10) Ability to control or address multiple servers simultaneously through a broadcast protocol,
11) Ability to support multiple remote controlling hosts on the same SMAB network as multiple servers.

The black box hardware required for each server to implement the Rack Server Management Architecture could consist of either a passive model that is server CPU driven or an active model that contains its own microprocessor that is likely on stand-by power.

1) The passive model would only be able to support a subset of the items listed above and would be geared toward a cost-sensitive market.
2) The active model would support bus mastering in the server's expansion bus (i.e. PCI bus) and could be powered in part by the SMAB, as in the case of IEEE1394. The active model would also allow out-of-band communication and control. This model allows inter-communication independent of Server Operating system and Processors.

As an example, the CRCU unit would accept up to 20 IEEE1394 inputs and route them to a 100Mb Ethernet output, which would then route to the remote controlling host(s).

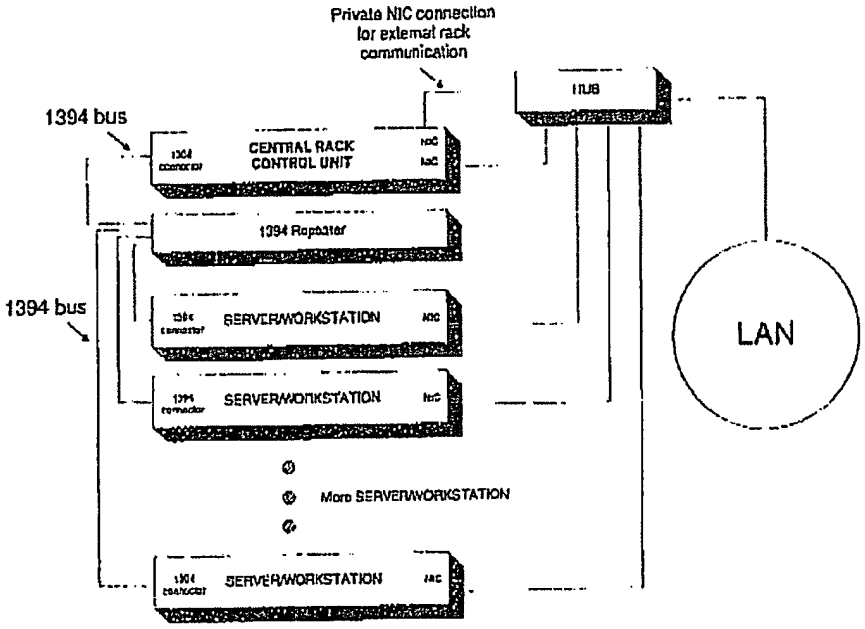


Figure 2 - CRCU 1394 Parallel Configuration

8. Overview

This disclosure describes a Rack Server Management Architecture, which provides a means for users to efficiently manage and maintain volumes of rack-mount servers. The architecture is basically an easy to use, side-band, high-speed networking bus connecting a rack of servers to a remote controlling computer.

9. Background

Currently, each server in a rack-mount configuration is a stand-alone unit from a server management standpoint. This implies a networking medium for each server, resulting in high cable count. Additionally, current implementations rely on either a slow speed, low cost or a high speed, high cost bus for the networking medium. Many implementations are point-to-point only, meaning that a host can connect to only one server at a time for management.

10. Description

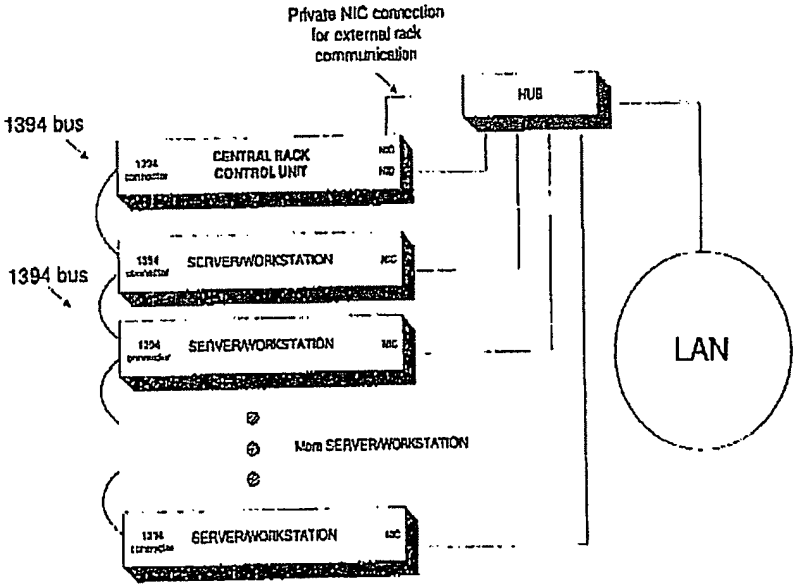


Figure 1 CRCU 1394 Daisy Chain configuration

With the Rack Server Management Architecture, all servers in a rack are connected together with a low cost, high speed serial bus (i.e. IEEE1394), to be referenced as the Internal Bus, which then connects to a central rack control unit (CRCU). Due to cable length limitations inherent in high speed serial bus designs, this central rack control unit is necessary to communicate over the long haul to a remote controlling host. This bus will be referred to as the External Bus. Perhaps as high speed serial bus technology progresses, the need for the External Bus will be eliminated, and the CRCU will become a simple multiplexing hub. See figure 1.

The CRCU is then linked to other CRCUs from other racks in a side-band network, in addition to any number of remote controlling host computers. The combination of the Internal Bus and External Bus will be called the Server Management Architecture Bus (SMAB).

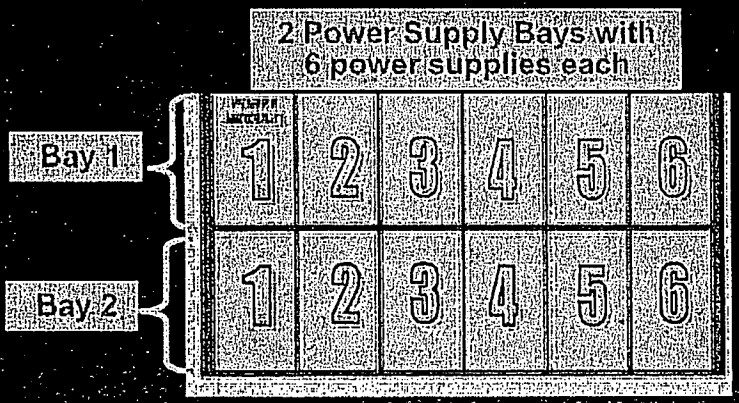
The abilities provided with the Rack Server Management Architecture greatly exceed what is typically done today, including but not excluding to:

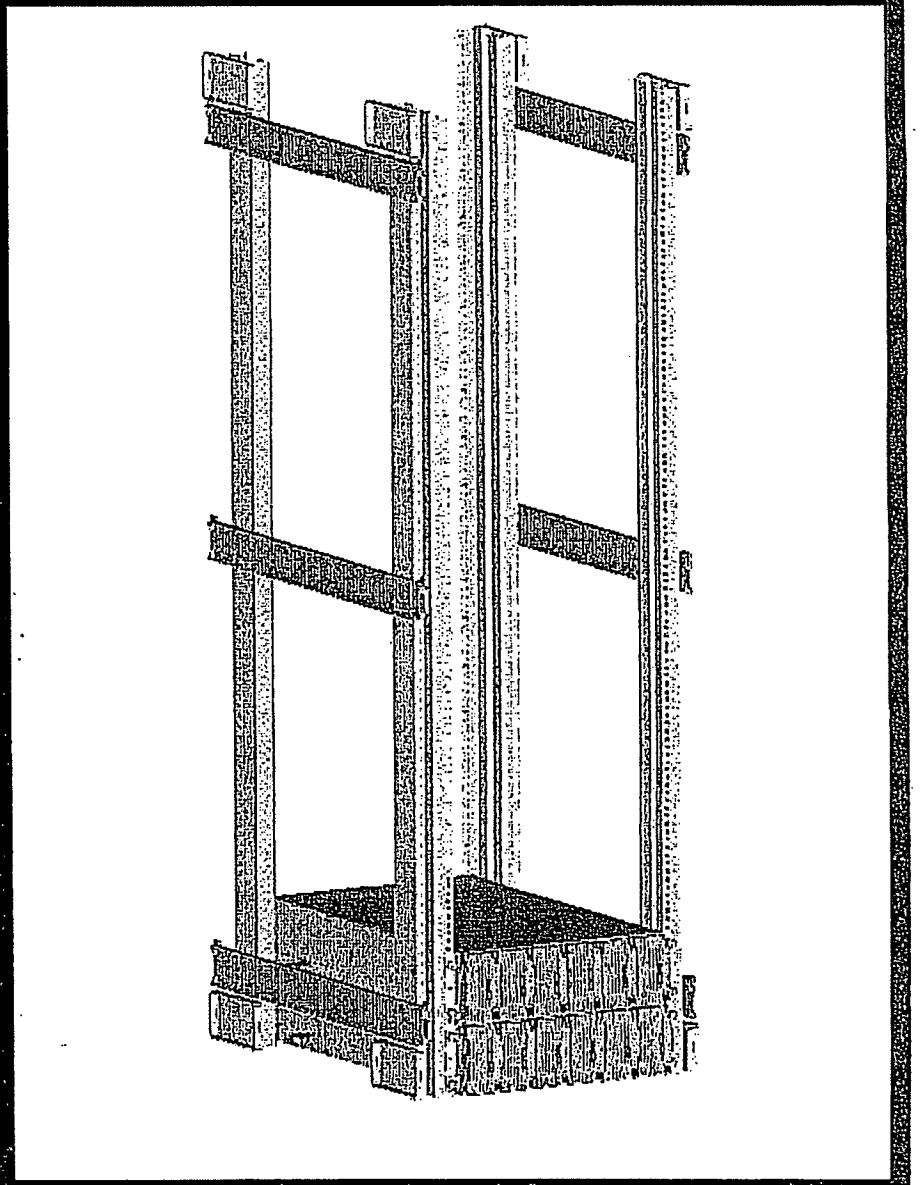
1) Ability to perform all server management on a side-band bus, not interfering with bandwidth on the server's production network.
2) The ability to hot add more server to the bus as needed.
3) Ability to transfer high volumes of data real-time, which allows monitoring of graphical video data while sending keyboard and mouse commands for a true remote console application.
4) Ability to download latest drivers, patches, service packs, configuration utilities, BIOS updates, etc. without taking down the server.
5) Ability to perform operating system builds from a remote host.

Exhibit Nguyen 2

Power Infrastructure

- Redundant Shelves
- Redundant AC Input
- Redundant power out
- Hot plug power supplies
- 18 KWatts max





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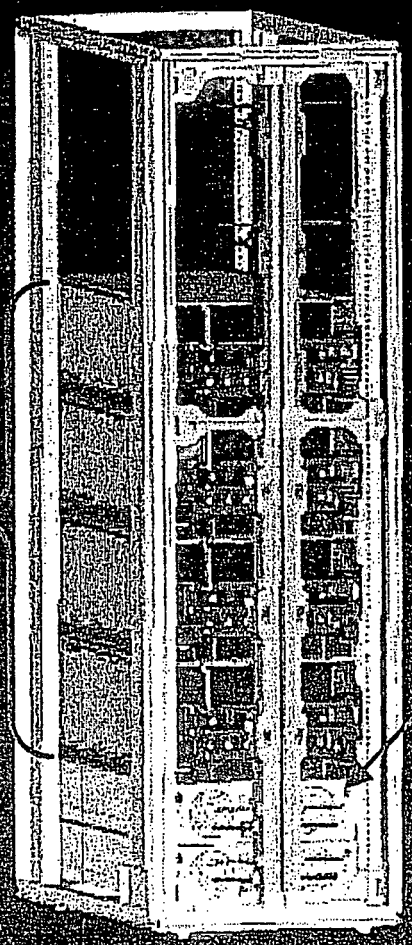
Power Infrastructure



Rear View

- Bus Bars
  - Deliver DC power from the power enclosures to the 6U inserts
  - Attached by hinges to the RETMA rails
  - Special requirements on dimensions from back rails to door

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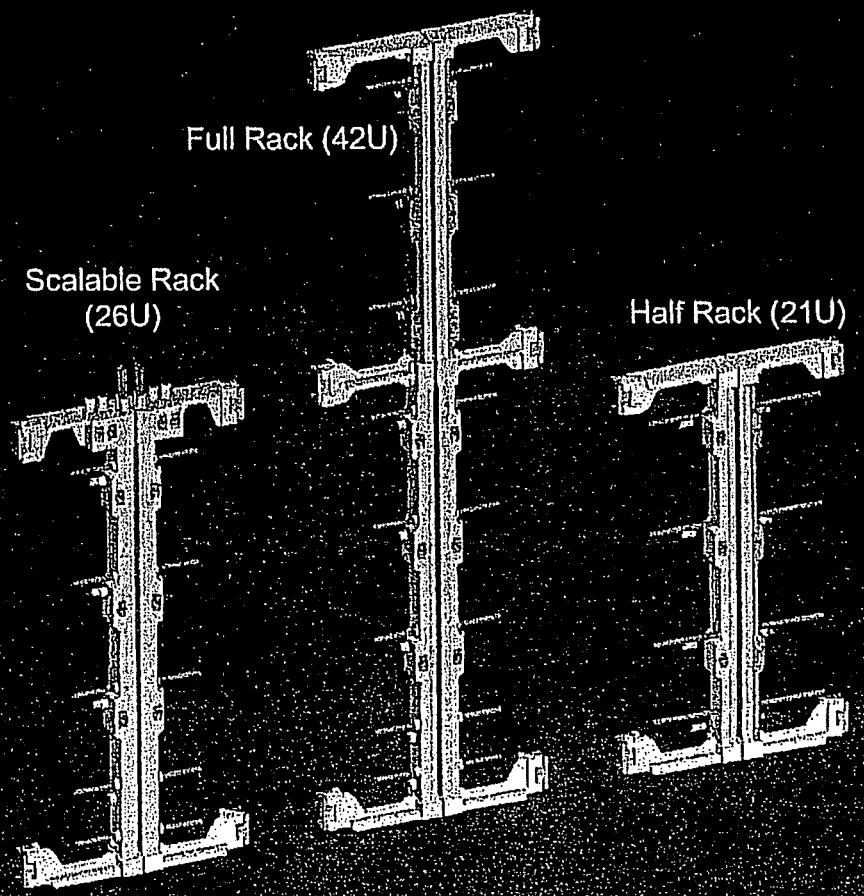
Bus Bar Family

- Scalable Rack
  - Allows for growth of up to 5 server blade enclosures (~10kW)
  - Other devices can be mounted in space above the bus bar
  - 1 or 2 power chassis mounted at the bottom (dependent on number of server blade enclosures)
- Full Rack
  - Allows for up to 6 server blade enclosures (~12kW)
  - 2 power chassis for 6 server blade enclosures
- Half Rack
  - Allows for up to 3 server blade enclosures (~6kW)
  - 1 power chassis for 3 server blade enclosures



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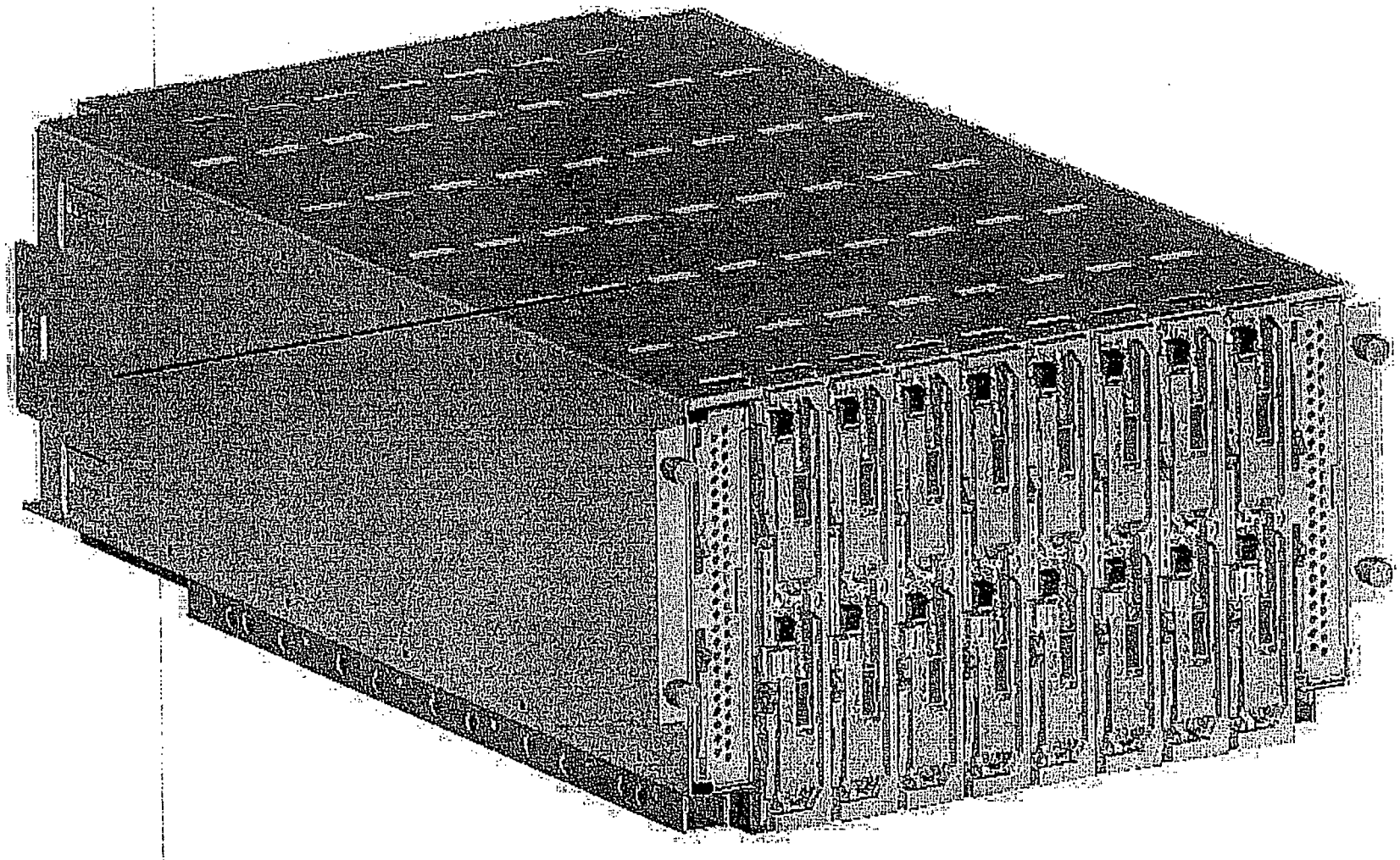
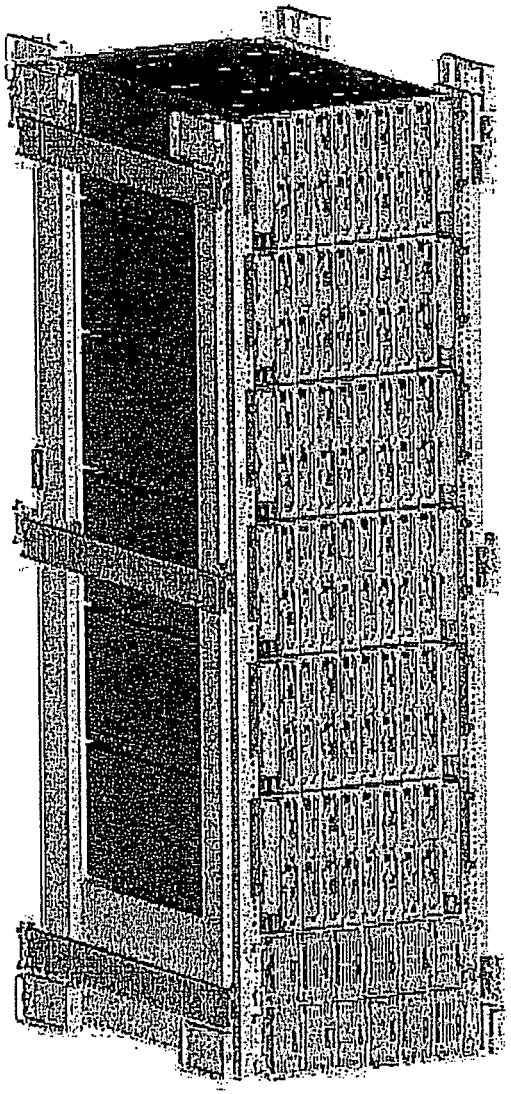
6U Server Insert





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The Backplanes

- Signal & Power Backplanes are intentionally separate
  - Power subsystem WILL be stable through WIND
  - Signal should be stable, but needs to very easy to service in field

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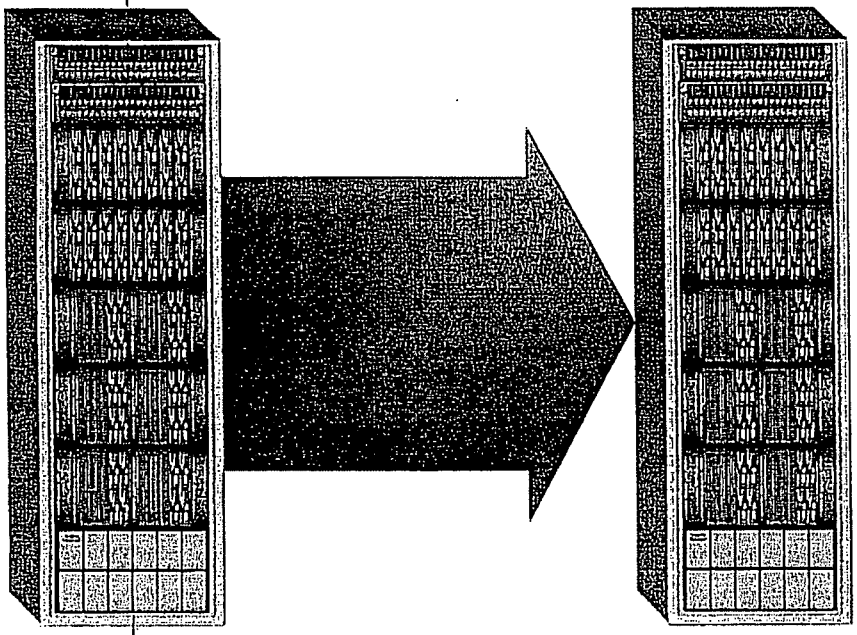
Blade server evolution
WIND is IB enablement in ICE Insert

Ice

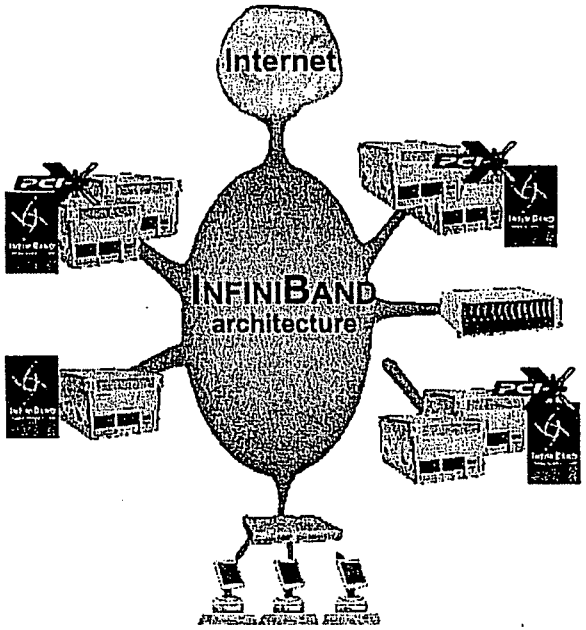


Ethernet
Backplane
2H01

Wind

Infiniband
Backplane
2H02

Infiniband



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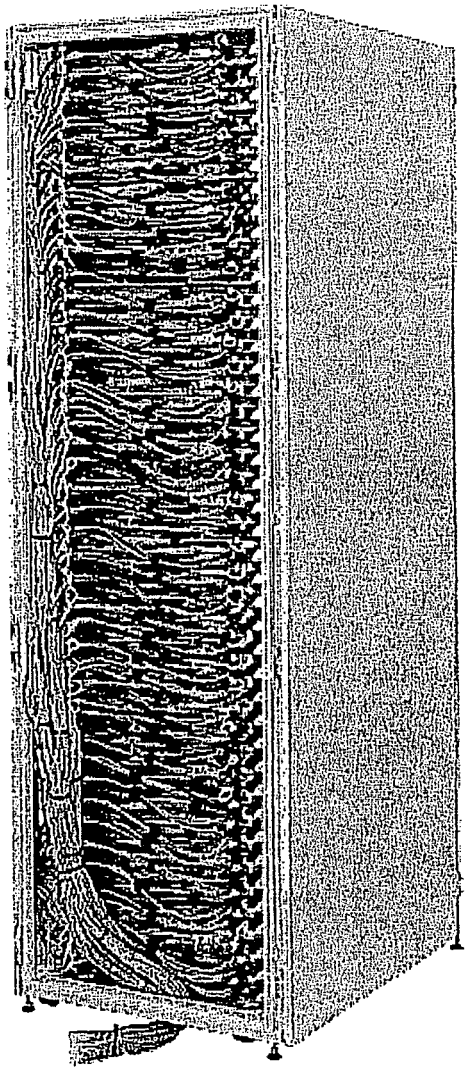
An SP's biggest nightmare...

Cabling



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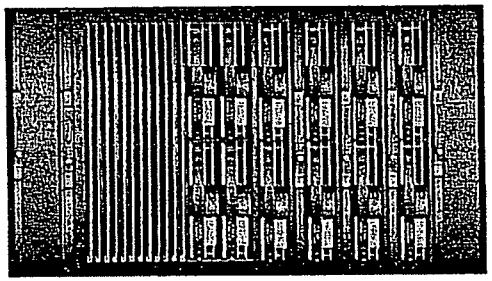
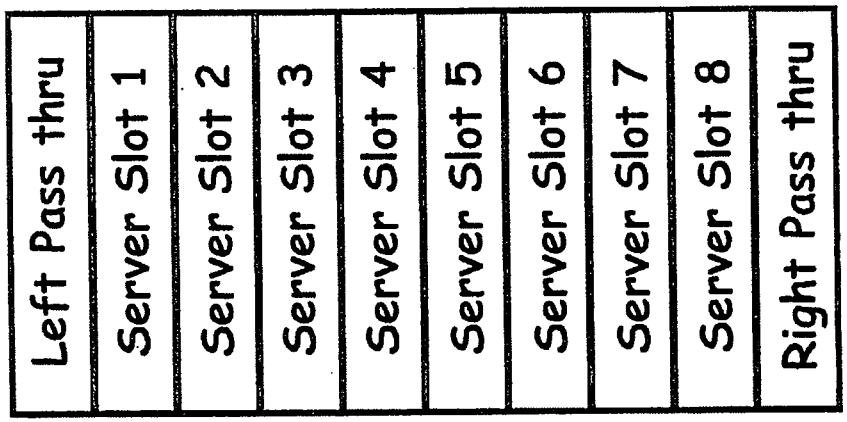
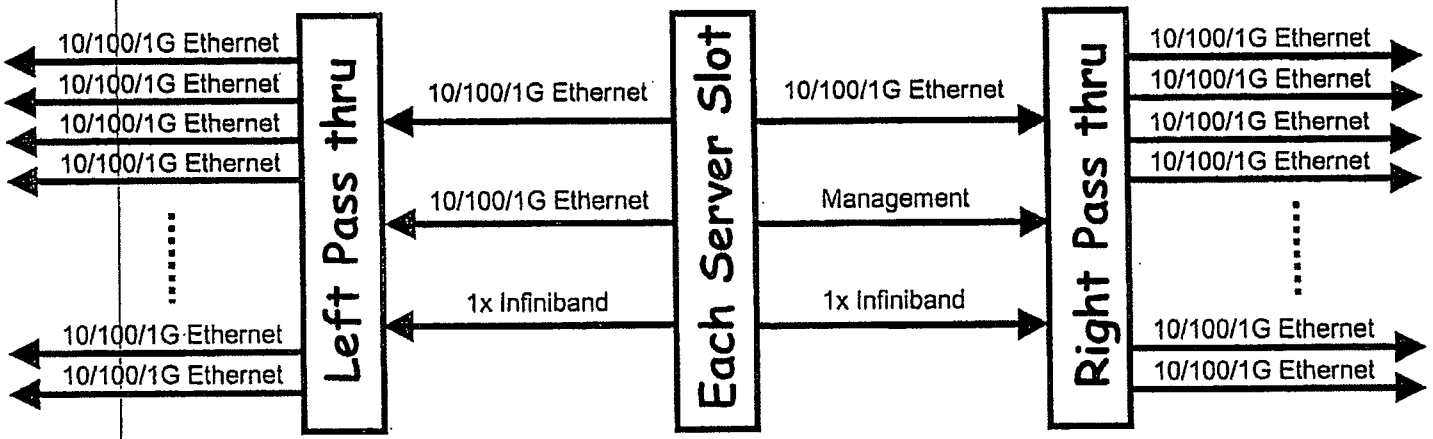
6U Server Insert Schematic







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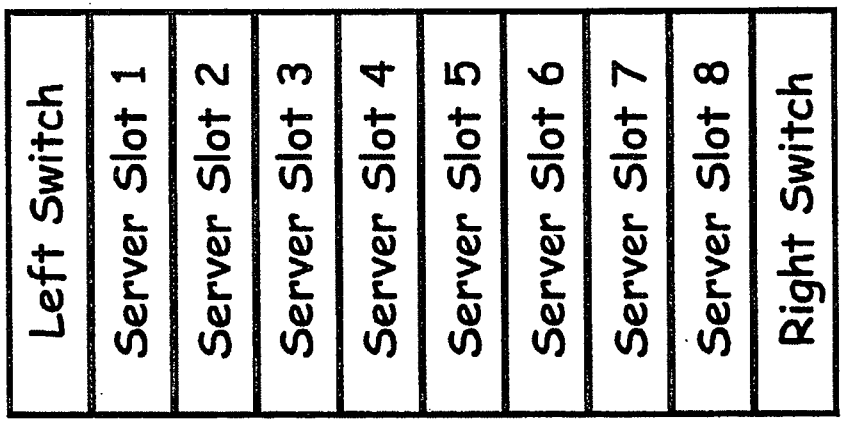
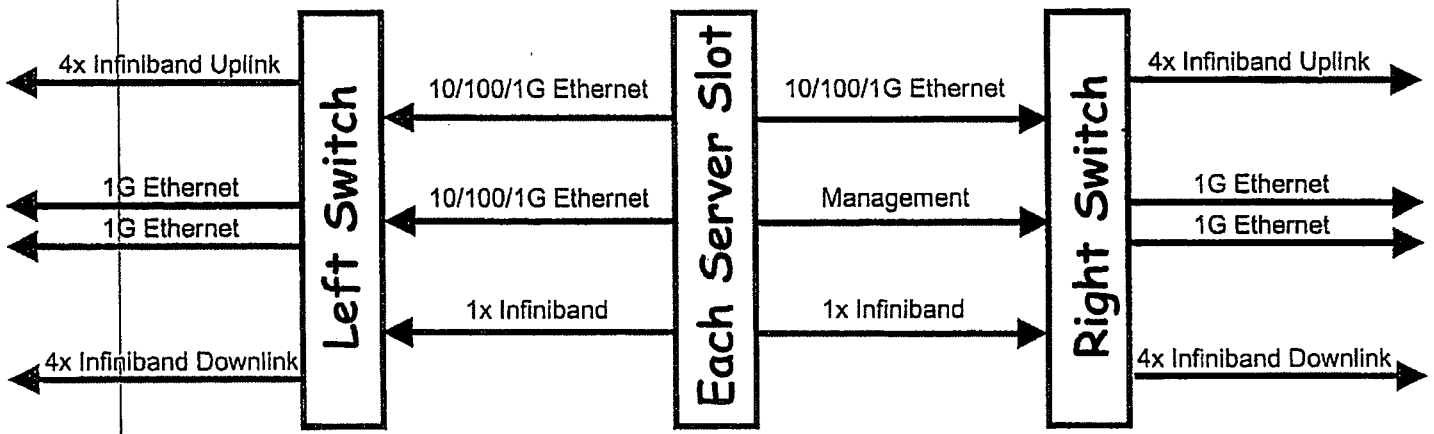
6U Insert with IB Switch





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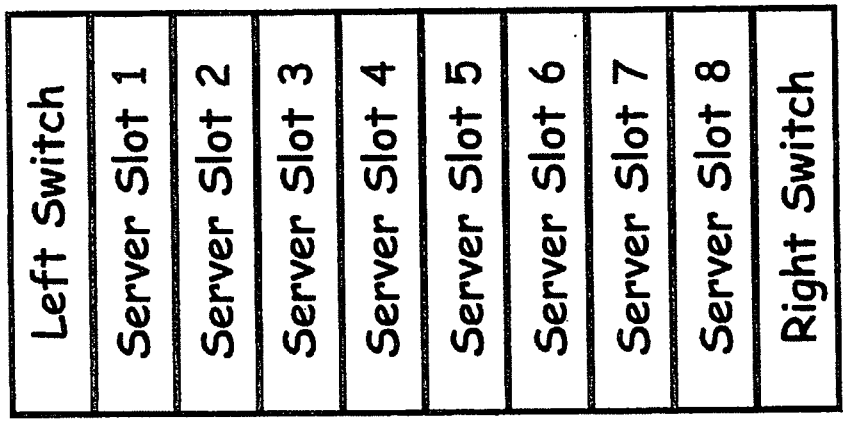
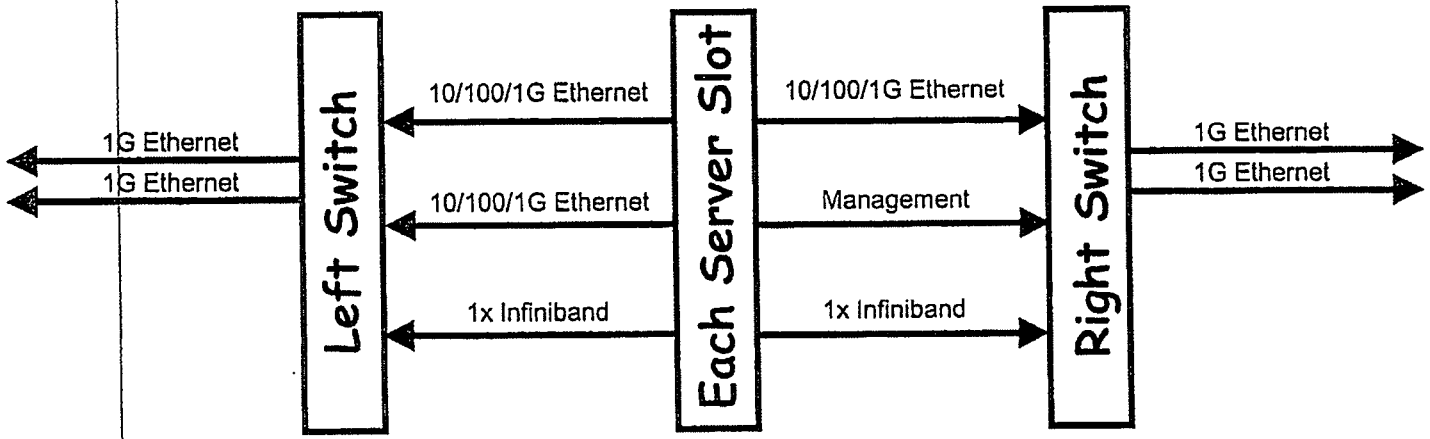
6U Insert with Port Aggregator





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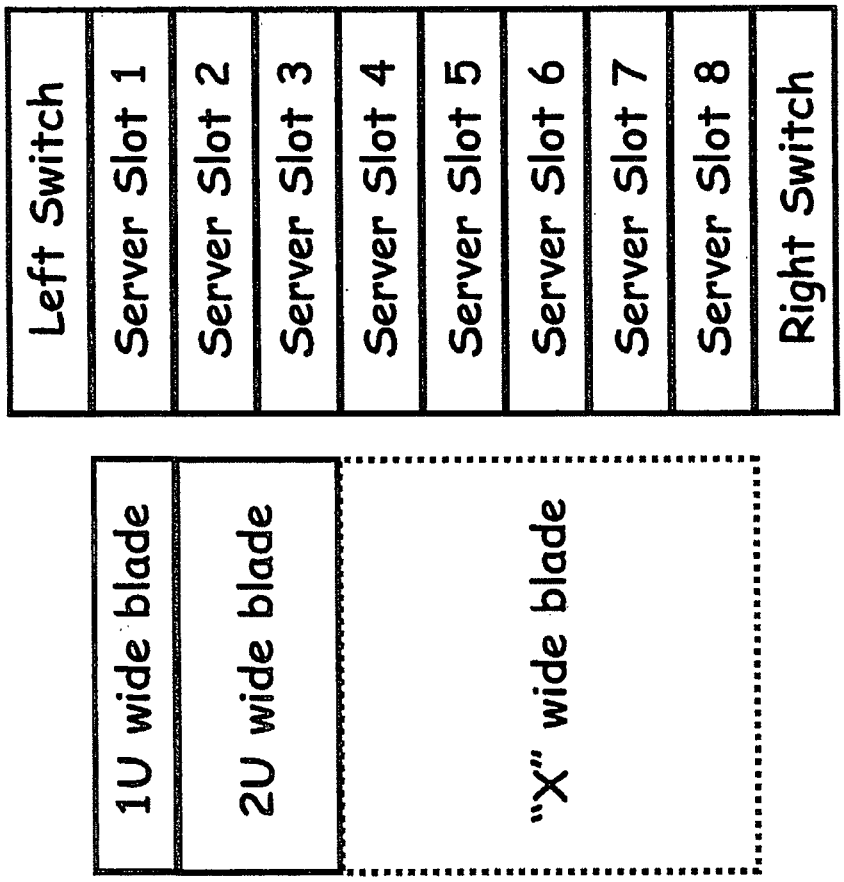
6U Server Insert



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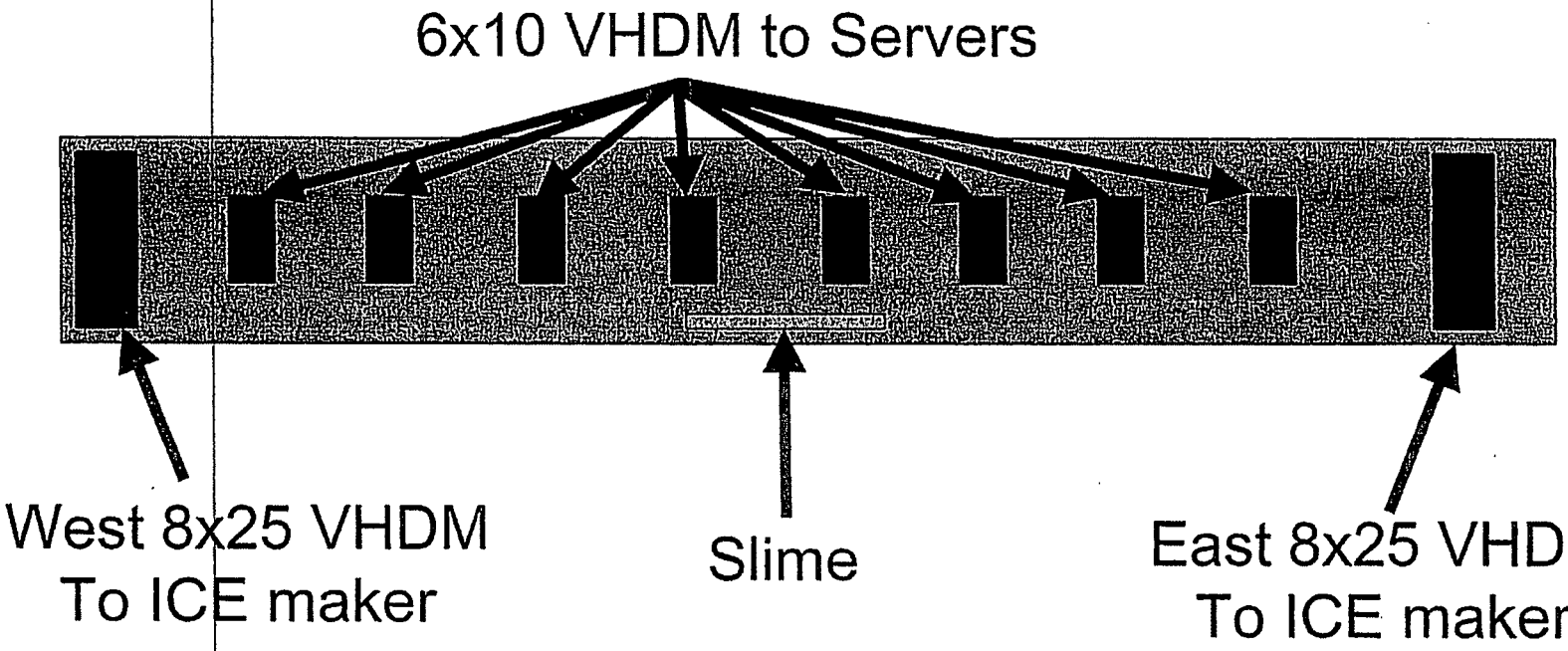
Very High Density Metric

ICE IP/IB backplane diagram



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